Oil Sands

A strategic resource for Canada, North America and the global market

Water Management

All major energy production requires water

Water requirements for oil sands production vary depending on the technology used for extraction.

Water is used in oil sands extraction to help separate heavy crude oil, also known as bitumen, from the sand, clay and water that make up the oil sands. Water is also used to produce hydrogen, essential in converting the bitumen into a lighter, upgraded crude oil.

Oil sands surface mining uses three to four barrels of new water to produce one barrel of bitumen, while the drilled, or in-situ, process uses just one barrel of new water.

Most of the water used is recycled

Most water used in oil sands development is recycled – up to 85 percent for mining and up to 90 percent for drilled; however, some new water is required to make up for water losses. New water comes from a variety of sources including on-site drainage, collected rainwater, underground brackish aquifers and the local watershed, including local rivers.

In-situ projects rely largely on groundwater for their water needs, with an ever-increasing amount being non-potable water. While in-situ operations do not generally use river water, mining operations withdraw their new water from the Athabasca River. The federal and provincial governments manage this water use by setting strict withdrawal limits from the river.

Less than one percent of the Athabasca River's annual flow is used by the oil sands

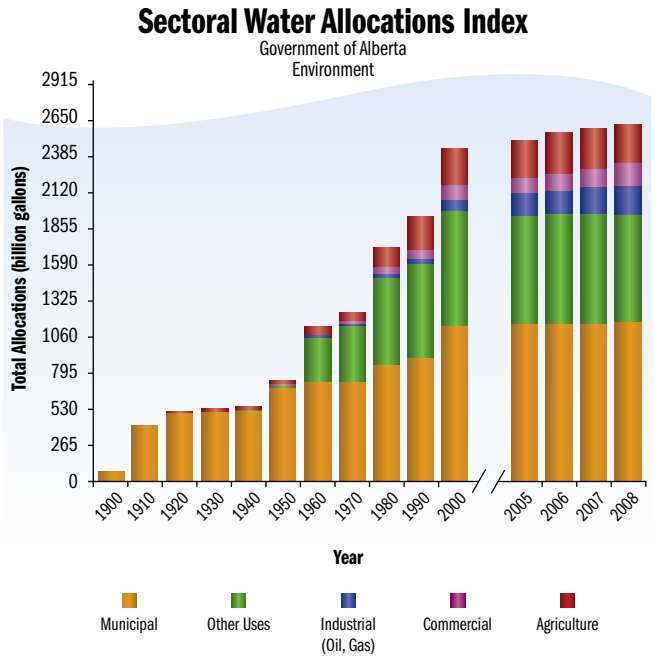
The Lower Athabasca River Water Management Framework ensures that during low flow conditions withdrawals never exceed 10 percent of the natural river flow. To protect the quality of the river water, no production water is returned to the river. Instead, it is transferred to tailings ponds and then recycled back into the production process. The Alberta government has established performance standards to reduce the accumulation of tailings that result from the oil sands mining process.

In 2002, oil sands mining operations used 114 million cubic meters of water. By 2009, they used approximately 107 million cubic meters to produce nearly twice as much oil. The Athabasca River Water Management Framework limits, monitors and adjusts the freshwater withdrawal from the river on a weekly basis. These limits maintain flows at or near natural levels, taking into account real-time conditions.

Strict water usage regulations apply

Provincial regulations for water use include daily limits for withdrawals from area waterways, limits on the use of brackish water from underground aquifers, and the regular monitoring of surface water and groundwater. Industry and governments continue to develop ways to further reduce the amount of water used in the extraction process.

In Alberta, water use for commercial, industrial, agricultural and municipal purposes requires a licence from Alberta Environment in order to use and divert water supplies. Allowed water uses are called allocations. Oil and gas water use includes both non-oil sands production and oil sands production. While irrigation and agriculture water allocation accounts for nearly 45 percent of Alberta's total water allocation, the oil sands industry accounts for only seven percent.



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